

What is claimed is:

10079520, 10079520

### CLAIMS

Claim 1. A selectively engageable friction mechanism comprising two parts and a housing, one of which is rotatable in respect to the other and the housing, at least two friction disks, one of said two friction disks being non-rotatively connected to one of the two parts, the other of said two friction disks being non-rotatively connected to the other of the two parts, said one of said two friction disks having a single cross-section, said one of said two friction disks having a surface, said surface being hardened and engagement means to engage said one with said other of said two friction disks so as to connect the two parts.

Claim 2. The selectively engageable friction mechanism of claim 1 characterized by the addition of attachment means to non-rotatively connect said one or said other part to the housing such that said engagement means functions as a brake for said other or said one part respectively.

Claim 3. The selectively engageable friction mechanism of claim 1 characterized in that both of the two parts are rotatively connected to the housing such that said engagement means functions as a clutch between the two parts.

Claim 4. The selectively engageable friction mechanism of claim 1 wherein the mechanism includes a planetary device having a sun gear, planet gears with a carrier and a ring gear characterized in that a part of the two parts coincides with a gear or carrier of the planetary device.

Claim 5. The mechanism of claim 4 characterized in that said one and said other of the two parts coincides with a gear or carrier of the planetary device.

Claim 6. The mechanism of claim 1 characterized in that there are five or more friction disks.

Claim 7. The mechanism of claim 1 characterized in that said surface is hard anodized and 35-65% of said thickness is saturated within said surface.

Claim 8. The mechanism of claim 1 characterized in that said surface is coated by a complex oxide ceramic.

Claim 9. The mechanism of claim 1 characterized in that said engagement means includes a piston, said piston being located in a cavity, said cavity being located in the housing

adjacent to said friction disks, said piston having actuated and non-actuated positions relative to said friction disks;

a bias assembly, said bias assembly engaging both said piston and said housing and including a single spring, said bias assembly biasing said piston into either of said actuated or non-actuated positions; and

a pressurization means, said pressurization means moving said piston into the other of said actuated or non-actuated positions.

Claim 10. A mechanism of claim 9 characterized in that said spring has an inner edge and an outer edge, said inner edge contacting either of said piston or said housing, and said outer edge contacting the other of said piston or said housing.

Claim 11. A mechanism of claim 10 characterized in that the spring is a belleville spring.

Claim 12. A mechanism of claim 9 characterized in that at least one washer is located intermediate between said spring and said housing.

Claim 13. A mechanism of claim 9 characterized in that said actuated position is synonymous with the brake being engaged.

Claim 14. A mechanism of claim 9 characterized in that said actuated position is synonymous with the brake being disengaged.

Claim 15. A mechanism of claim 7 characterized in that said surface is composed of an anodized metal, such metal preferably being aluminum.

Claim 16. A selectively engageable friction mechanism comprising a shaft and a housing, said shaft being selectably rotatable in respect to said housing;

a multiplicity of friction disks, said friction disks being non-rotatably connected to said shaft, said friction disks having an engagement surface, said engagement surface having a single cross section;

a multiplicity of reaction disks, said reaction disks being non-rotatably connected to said housing, said friction disks being interleaved with said reaction disks;

a piston, said piston being located in a cavity, said cavity being located in said housing adjacent to one of said

friction or said reaction disks, said piston having actuated and non-actuated positions relative to said one of said disks;

a bias assembly, said bias assembly engaging both said piston and said housing and including a single spring, said bias assembly biasing said piston into either of said actuated or non-actuated positions; and

a pressurization means, said pressurization means moving said piston into the other of said actuated or non-actuated positions.

Claim 17. A mechanism of claim 16 characterized in that said spring has an inner edge and an outer edge, said inner edge contacting either of said piston or said housing, and said outer edge contacting the other of said piston or said housing.

Claim 18. A mechanism of claim 17 characterized in that the spring is a belleville spring.

Claim 19. A mechanism of claim 16 characterized in that at least one washer is located intermediate between said spring and said housing.

Claim 20. A mechanism of claim 16 characterized in that said actuated position is synonymous with the brake being engaged.

Claim 21. A mechanism of claim 16 characterized in that said actuated position is synonymous with the brake being disengaged.

Claim 22. A mechanism of claim 16 characterized in that said friction disks are composed of an anodized metal, such metal preferably being aluminum.

Claim 23. A mechanism of claim 22 characterized in that said friction disks are covered with Keronite.

Claim 24. A mechanism of claim 16 characterized in that said shaft is interconnected to a drive mechanism.

Claim 25. A selectively engageable friction mechanism comprising a shaft and a housing, said shaft being selectably rotatable in respect to said housing;

a multiplicity of friction disks, said friction disks being non-rotatably connected to said shaft, said friction disks being composed of an anodized metal and having an

engagement surface, said engagement surface having a single cross section;

a multiplicity of reaction disks, said reaction disks being non-rotatably connected to said housing, and said friction disks being interleaved with said reaction disks;

a piston, said piston being located in a cavity, said cavity being located in said housing adjacent to one of said friction or said reaction disks, said piston having actuated and non-actuated positions relative to said one of said disks;

at least two seals, said seals being located in said piston and contacting said housing so as to provide at least one pressurizable chamber within said cavity;

a means of selectably pressurizing said at least one chamber said means allowing movement of said piston into either of said actuated or non-actuated positions;

a bias assembly, said bias assembly engaging both said piston and said housing and including a single spring;

said spring having an inner edge and an outer edge, said inner edge being radially displaced from said outer edge, said inner edge contacting either of said piston or said housing, and said outer edge contacting the other of said piston or said housing; and

said bias assembly biasing said piston into the other of said actuated or non-actuated positions.



Claim 26. A mechanism of claim 25 characterized in that at least one washer is located intermediate between said spring and said housing.

Claim 27. A mechanism of claim 25 characterized in that said actuated position is synonymous with the brake being engaged.

Claim 28. A mechanism of claim 25 characterized in that said actuated position is synonymous with the brake being disengaged.

Claim 29. A mechanism of claim 25 characterized in that said friction disks are preferably aluminum.

Claim 30. A mechanism of claim 25 characterized in that said friction disks are covered with Keronite.

Claim 31. A mechanism of claim 25 characterized in that said shaft is interconnected to a drive mechanism.

Claim 32. A selectively engageable friction mechanism comprising a shaft and a housing, said shaft being selectably rotatable in respect to said housing;

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a multiplicity of friction disks, said friction disks being non-rotatably connected to said shaft, said friction disks being composed of an anodized metal and having an engagement surface, said engagement surface having a single cross section;

a multiplicity of reaction disks, said reaction disks being non-rotatably connected to said housing, there being an equal number of said friction disks and said reaction disks, said friction disks being interleaved with said reaction disks;

a piston, said piston being located in a cavity, said cavity being located in said housing adjacent to said reaction disks, said piston having actuated and non-actuated positions relative to said reaction disks;

three seals, said seals being located in said piston and contacting said housing so as to provide two pressurizable chambers within said cavity;

a means of selectably pressurizing at least one of said chambers, the pressurization of either of said chambers allowing movement of said piston into either of said actuated or non-actuated positions;

a bias assembly, said bias assembly engaging both said piston and said housing and including a single spring;

said spring having an inner edge and an outer edge, said inner edge being radially displaced from said outer edge,

said inner edge contacting either of said piston or said housing, and said outer edge contacting the other of said piston or said housing;

at least one washer, said washer being located between said spring and said housing; and

said bias assembly biasing said piston into the other of said actuated or non-actuated positions.

Claim 33. In a selectably engageable mechanism having a shaft and a bearing, there being a movable part surrounding the shaft, the improvement means for the movable part to contact the bearing to provide a bearing stop.

Claim 34. In a selectively engageable mechanism having a shaft with a bearing, the improvement of the inner race of the bearing being coextensive with the shaft.

Claim 35. In a selectively engageable mechanism between a shaft and another part, the improvement comprising a device.